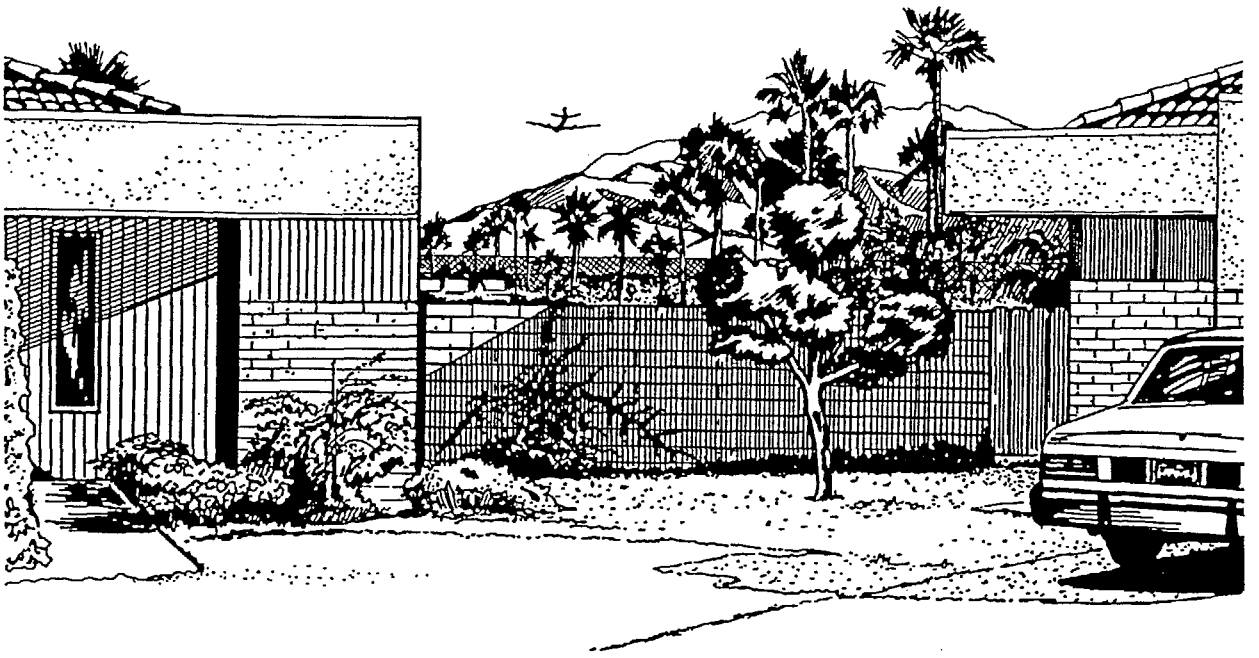
Chapter Five
ENVIRONMENTAL EVALUATION



Chapter Five
ENVIRONMENTAL EVALUATION

INTRODUCTION

Analysis of the potential environmental impacts of proposed airport development projects is an important component of the Airport Master Plan process. The primary purpose of this chapter is to evaluate the proposed development program for Mesa-Falcon Field Airport to determine whether proposed development actions individually or collectively would significantly affect the quality of the environment. A major component of this evaluation is to coordinate with appropriate federal, state and local agencies to identify potential environmental concerns that should be considered prior to the design and construction of any new facilities. Agency coordination consisted of correspondence requesting comments and/or information regarding the proposed airport development. Issues of concern that were identified as part of this process are presented in the following discussion. Letters received from various agencies are included in **Appendix B.**

The construction of some of the projects at the Mesa-Falcon Field Airport may require compliance with the National Environmental Policy Act of 1969 (NEPA). Compliance with NEPA is generally satisfied by the preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS). While this section of the master plan is not expected to satisfy NEPA requirements, it is intended to supply a preliminary review of environmental considerations that would be analyzed in more detail within the NEPA process.

PROPOSED DEVELOPMENT

As a result of the Master Plan analysis, a number of airport improvements have been recommended for implementation over the planning period. Sheets No. 2 through 4

(Chapter 6) illustrate the development proposed during this period. The major projects planned for completion include the following:

- Extend Runway 4R-22L to 6,100 feet.
- Acquire 71.4 acres of land for approach protection, Rwy 22L.
- Acquire 33.3 acres of land for general aviation expansion.
- Construct T-Hangars.
- Install Nondirectional Radiobeacon (NDB) on airport.
- Construct above ground fuel storage area.
- Remove/replace underground fuel storage tanks.
- Construct Falcon Drive underpass.
- Construct taxiways/taxilanes to improve airport efficiency.
- Relocate PAPI's and wind cones, Runway 4R-22L.
- Install MIRL and MITL on runway/taxiway extensions.
- Install ASOS.
- Remove/relocate T-Hangars.
- Install airport security fencing.
- Acquire nonprecision instrument approaches to Runway 4R-22L.
- Construct access road.
- Construct perimeter road.
- Expand terminal building.
- Install REIL's Runway 4L-22R.
- Install taxiway signage.
- Construct auto parking facilities.
- Install limited access gates.
- Construct access taxiway to northeast apron area.

ENVIRONMENTAL CONSEQUENCES - SPECIFIC IMPACTS

The purpose of this section is to briefly examine potential impact areas as they relate to the proposed airport development actions. The following subsections address each of the specific impact categories outlined by FAA Order 5050.4A.

NOISE CONTOUR DEVELOPMENT

Aircraft noise emissions are often the most noticeable environmental effect an airport will produce on the surrounding community. If the sound is sufficiently loud or frequent in occurrence, it may interfere with various activities or otherwise be considered objectionable. To determine noise related impacts that the proposed airport development could have on the environment surrounding Mesa-Falcon Field, noise exposure patterns must be analyzed. This includes examination of existing noise exposure and comparisons of this exposure with projected future conditions.

The basic methodology employed to define aircraft noise levels involves the extensive use of a mathematical model for aircraft noise prediction. The day-night average sound level (Ldn) is used in this study to assess aircraft noise. Ldn is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and the Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. Federally funded airport noise studies use Ldn as the primary metric for evaluating noise.

Ldn is defined as the average A-weighted sound level as measured in decibels, during a 24-hour period. A 10 decibel (dB) penalty is applied to noise events occurring at night (10:00 p.m. to 7:00 a.m.). Ldn is a summation metric which allows objective analysis and can describe noise exposure comprehensively over a large area.

Since noise decreases at a consistent rate in all directions from a source, points of equal Ldn noise levels are indicated by means of a contour line. The various contour lines are then superimposed on a map of the airport and its environs. It is important to recognize

that a line drawn on a map does not imply that a particular noise condition exists on one side of the line and not on the other. Ldn calculations do not precisely define noise impacts. Nevertheless, Ldn contours can be used to: 1) highlight existing or potential incompatibilities between an airport and any surrounding development; 2) assess relative exposure levels; 3) assist in preparation of airport environs land use plans; and 4) provide guidance in the development of land use control devices, such as zoning ordinances, subdivision regulations and building codes.

The use of a computerized noise prediction model is required in noise studies because the development of noise contours directly from field studies would require months of measurement at numerous noise measurement sites -- a very impractical, extremely expensive, and time consuming method of evaluation.

The noise contours for Mesa-Falcon Field Airport were developed from the Integrated Noise Model, Version 3.9. The Integrated Noise Model (INM) was developed by the Transportation Systems Center of the U.S. Department of Transportation at Cambridge, Massachusetts, and has been specified by the FAA as one of two models acceptable for federally funded noise analyses.

The INM is a computer model which accounts for each aircraft along flight tracks during an average 24 hour period. These flight tracks are coupled with separate tables contained in the data base of the INM which relate to noise, distance and engine thrust for each distinct aircraft type selected.

Computer input files for Mesa-Falcon Field Airport were prepared for the existing condition (1991), and for the year 2015. The evaluation for the year 1991 was based on the existing airfield facilities. For the 2015 condition, it was assumed that the proposed development would be fully implemented. The input files contained operational data, runway utilization, aircraft flight tracks, and fleet mix. The operational data and aircraft fleet mix are summarized in Table 5A.

TABLE 5A
Fleet Mix and Operational Data
Mesa-Falcon Field Airport

	Average Daily Operations	
	1991	2015
General Aviation Itinerant		
Single Engine Piston	172	82
Twin Engine Piston	19	118
Turboprop	9	21
Turbojet	<1	16
Helicopter	40	79
General Aviation Itinerant - Total	241	323
General Aviation Local		
Single Engine Piston	309	601
Twin Engine Piston	33	19
Turboprop	4	5
Turbojet	0	2
Helicopter	67	14
General Aviation Local - Total	413	641
TOTAL OPERATIONS	654	958

EXISTING NOISE CONDITIONS

The aircraft noise contours representing the 60, 65, 70 and 75 Ldn were developed and evaluated for the existing conditions at Mesa-Falcon Field Airport and illustrated on Exhibit 5A. Based on the FAA's Integrated Noise Model, the total area encompassed within the 65 Ldn noise contour for Mesa-Falcon Field Airport is approximately 150 acres. Of this area, 32 acres are situated within the 70+ Ldn contour, and 21 acres are located within the 75+ Ldn contour. Based on the existing condition and operational levels, the entire 65 Ldn noise contour footprint of the airport is completely contained within airport property.

FUTURE NOISE CONDITIONS - 2015

The aircraft noise contours representing forecasted activity in the year 2015, with the proposed airfield and landside improvements, are illustrated on Exhibit 5B. Based on forecasted activity for this year, the 65 Ldn contour would encompass approximately 415 acres. Of this area, 96 acres are included within the 70+ Ldn contour, and 91 acres of this area are located within the 75+ Ldn contour. The noise contours for 2015, with the proposed runway improvements in place, would represent a 176 percent increase in the total area that would be within the 65+ Ldn contour over that of the existing condition.

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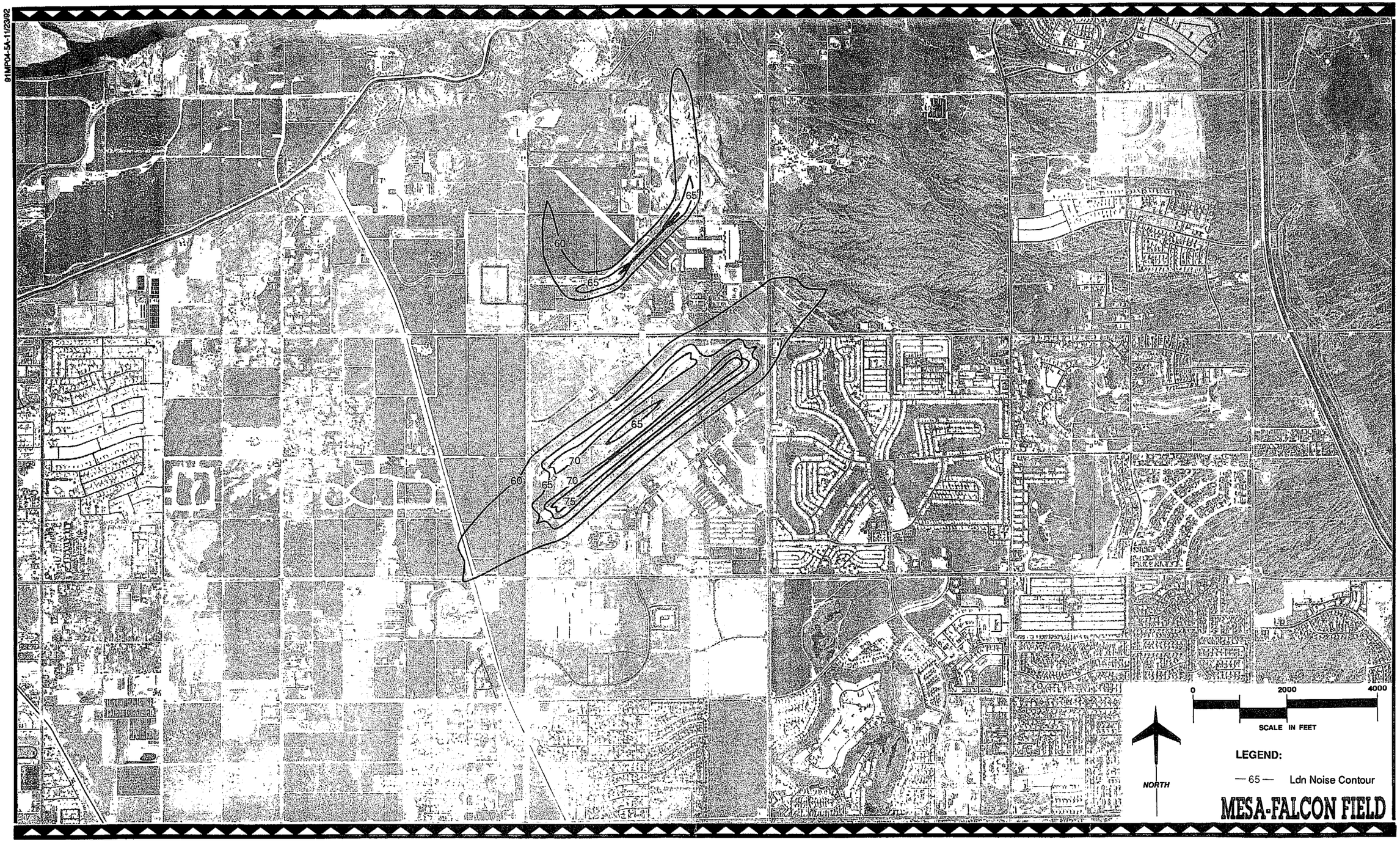

Exhibit 5A
EXISTING NOISE CONTOURS 1991

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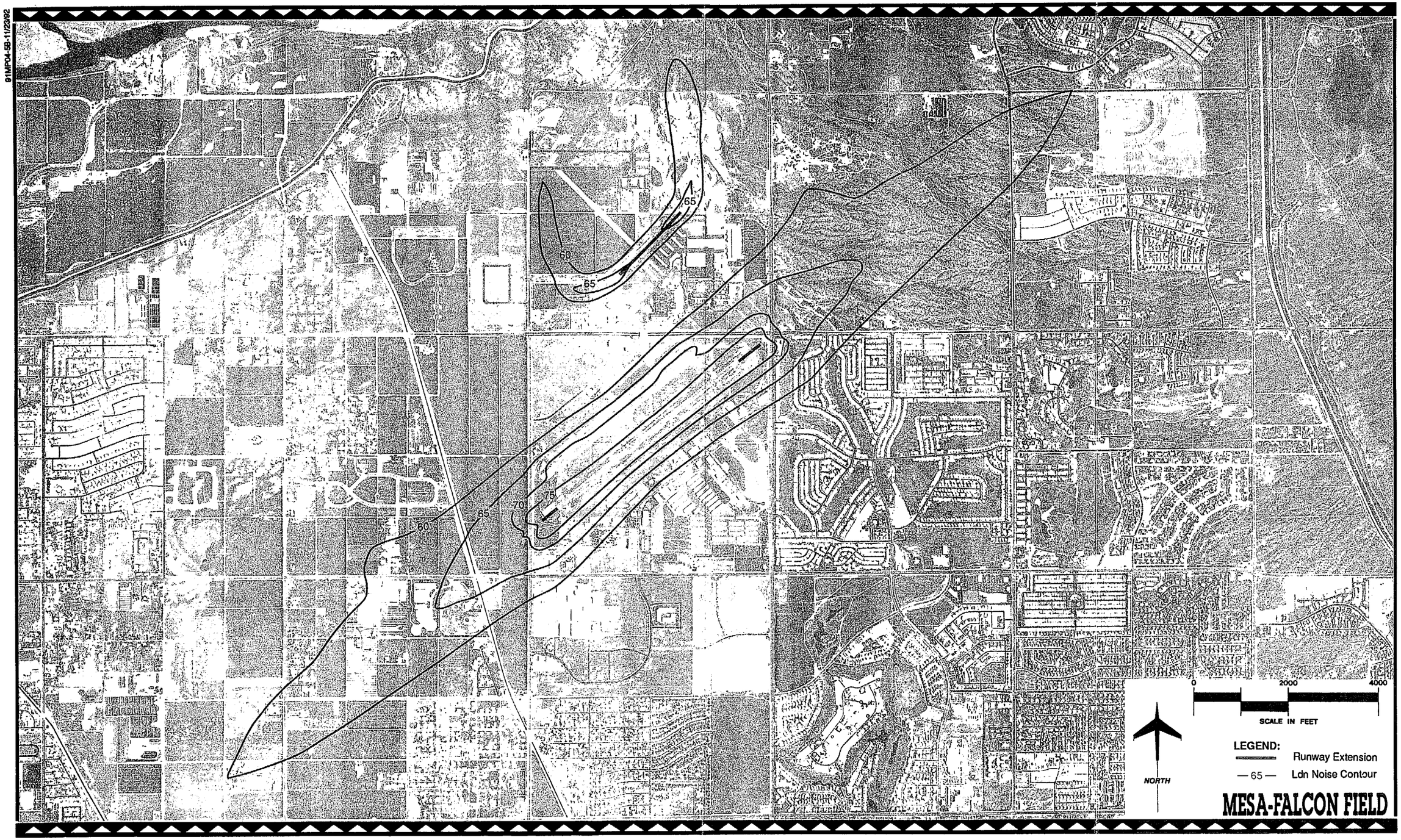

Exhibit 5B
FUTURE NOISE CONTOURS 2015

Although most of the 65 Ldn noise contour impacts are on airport property, approximately 108 acres of off-airport impacts will occur. Approximately 75 acres of off-airport noise impact will occur on property northeast of the airport. Most of these impacts will occur on property included in the Runway Protection Zone (RPZ) for Runway 22L. A portion of this land is under an avigation easement and provisions have been made within the airport's development program to obtain additional easements or fee simple purchase of the property.

Approximately 19 acres of off-airport property to the southwest will also be affected by the 65 Ldn noise contour. Acquisition of the property by the City of Mesa has been included in the early stages of the development program. No significant noise impacts are anticipated to occur on any of these properties located off-airport.

COMPATIBLE LAND USE

The degree of annoyance which people suffer from aircraft noise varies depending on their activities at any given time. Studies indicate that people are not likely to be as disturbed by aircraft noise when they are shopping, working, or driving as when they are at home. Transient hotel and motel residents seldom express as much concern with aircraft noise as do permanent residents of an area.

The concept of "land use compatibility" has arisen from this systematic variation in human tolerance to aircraft noise. Studies by governmental agencies and private researchers, in particular those by the Department of Housing and Urban Development (HUD) and FAA, have defined the compatibility of different land uses with various noise levels. **Table 5B** lists land use compatibility guidelines from **Federal Aviation Regulation (F.A.R.) Part 150.** These are only guidelines. Part 150 explicitly states that determinations of noise compatibility and regulation of land use are purely local responsibilities.

The future land uses recommended in this area are contained in the General Plan for the City of Mesa. An Air Field Overlay District has been designed to incorporate the 1985 Noise Contours based upon the airport's projected aircraft mix and total operations at full capacity. In December 1990, the City adopted Ordinance #2574 which established the Air Field Overlay District and eight Compatible Use Sub- Districts within the Overlay District. These Sub-Districts describe areas within which specific land uses are recommended and sound attenuation requirements, in some cases, are prescribed. The ordinance also contains height restrictions to be applied in the area surrounding the airport. A copy of the City of Mesa's Air Field Overlay District Ordinance is included in **Appendix C.**

SOCIAL IMPACTS

Social impacts known to result from airport improvement projects are often associated with relocation activities or other community disruption. Implementation of the proposed airport development will not require the relocation of residences or businesses.

The development of the proposed runway extension and other on-airport development projects are not anticipated to alter surface transportation patterns; divide or disrupt established communities; disrupt orderly, planned development; nor create an appreciable negative change in employment.

INDUCED SOCIOECONOMIC IMPACTS

Significant shifts in patterns of population movement or growth or public service demands are not anticipated as a result of the proposed project. It is expected, however, that the proposed new airport development

would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, will encourage or attract additional users. It is expected to encourage tourism, industry, and trade as well as the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development will be primarily positive in nature.

AIR QUALITY

The federal government has set health-based ambient air quality standards for the following six pollutants: carbon monoxide (CO), nitrogen dioxide (NOx), sulphur dioxide (SOx), lead, and PM10 (particulate matter of 10 microns or smaller). Non-attainment refers to those areas that, by virtue of their air pollutant emission trends, violate these national standards. Mesa is located within the Maricopa County non-attainment area for PM10, CO and ozone.

The Arizona Department of Environmental Quality was contacted to determine the potential impacts the proposed development would have on air quality. The department declined to comment on the air quality aspects of the planned project. The Maricopa County Bureau of Air Pollution was provided data to be used in quantifying pollutants generated by airports in the County. However, it was recommended that steps be taken during construction and implementation activities to minimize the amount of particulate matter (fugitive dust) generated as a result of the project.

The generation of fugitive dust as a result of construction activities is anticipated due to the movement of heavy construction equipment and the exposure and disturbance of surface soils. This impact is expected to be both temporary and localized. The following preventive and mitigative measures were recommended and should be utilized during construction. Applicable State regulations are contained in AAC R18-2-404, 405, 406, and 407.

Site Preparation

- Minimize land disturbance.
- Use watering trucks to minimize dust.
- Cover trucks when hauling dirt.
- Stabilize the surface of dirt piles if not removed immediately.
- Use windbreaks to prevent any accidental dust pollution.
- Limit vehicular paths and stabilize these temporary roads.
- Pave all unpaved construction roads and parking areas to a length of no less than 50 feet where such roads leave the construction area.

Construction

- Cover trucks when transporting materials.
- Use dust suppressants on traveled paths which are not paved.
- Minimize unnecessary vehicular and machinery activities.
- Minimize dirt track-out by washing or cleaning trucks before leaving the construction site.

Post-Construction

- Revegetate any disturbed land not used.
- Remove unused material.
- Remove dirt piles.
- Revegetate all vehicular paths created during construction to avoid future off-road vehicular activities.

According to FAA Order 5050.4A, which states that *"The 1982 Airport Act requires that in order to operate in the state, objects involving airport location, runway location, or a major runway extension shall not be approved unless the governor of the state in which the project is located certifies that there is "reasonable assurance" that the project will be located, designed, constructed, and operated*

in compliance with applicable air and water quality standards"...

In this regard, portable sources of air pollution such as rock, sand, gravel and asphaltic concrete plants will be required to receive Installation and Operating permits from the Office of Air Quality.

WATER QUALITY

Water quality concerns related to airport expansion most often relate to the following.

- Domestic sewage disposal.
- Increased surface runoff and soil erosion.
- Storage and handling of fuel, petroleum, solvents, etc.

The airport provides both septic and sewer system service on the airport. Sewer service has been made available to most areas of the airport, however, some facilities are still on septic systems. It is anticipated that the quantity of sewage that would be generated by the proposed project activities could easily be handled with the existing sewer lines available to the airport. The future potential to connect all facilities to a sanitary sewer system is dependent upon the City of Mesa's capital improvement plans for expansion of sewer lines on the airport.

Implementation of the proposed project will result in an increase in impermeable surfaces and a resultant increase in surface runoff for both landside and airside facilities. The proposed development might have short-term effects on water quality, particularly suspended sediments, during and shortly after precipitation events in the construction phase.

Recommendations established in FAA Advisory Circular 150/5370-10A, **Standards for Specifying Construction of Airports, item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control** will be incorporated in project design specifications to further mitigate potential impacts. These standards include temporary measures to control water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, slope drains, and other control devices (see section on Construction Impacts).

Spills, leaks and other releases to the environment of hazardous substances are often a concern at airports due to fuel storage, fueling activities and maintenance of aircraft. Storm water flowing over impermeable surfaces may pick up petroleum product residues, and, if not controlled, transport them off site. Perhaps the most crucial concern would be spills or leaks of substances that could filter through the soil and contaminate groundwater resources.

Federal and State laws and regulations have been established to safeguard these facilities and activities. These regulations include standards for underground tank construction materials and the installation of leak or spill detection devices.

The airport has begun a program to ultimately remove/replace all underground storage tanks with above ground or vaulted tanks. The above ground storage tanks will be constructed and designed to meet the current EPA and State standards. Ultimately, the underground storage tanks will be disposed of in accordance with the State and local guidelines for underground tank disposal.

Based on the Facility Requirements analysis conducted for this study, future fuel storage needs by the end of the planning period would likely total 125,000 gallons per month. Fuel tanks and other material storage areas will be designed for compliance with applicable laws and regulations.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F) LANDS

Paragraph 47e, FAA Order 5050.4A provides the following.

(7)(a) "Section 4(f) provides that the Secretary shall not approve any program or project which requires the use of any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance, or any land from an historic site of national, state or local significance as determined by the officials having jurisdiction thereof unless there is no feasible and prudent alternative to the use of such land and such program includes all possible planning to minimize harm."

(7)(b) "...When there is no physical taking but there is the possibility of use of or adverse impacts to section 4(f) land, the FAA must determine if the activity associated with the proposal conflicts with or is compatible with the normal activity associated with this land. The proposed action is compatible if it would not affect the normal activity or aesthetic value of a public park, recreation area, refuge, or historic site. When so construed, the action would not constitute use and would not, therefore, invoke Section 4(f) of the DOT Act."

There are no Section 4(f) facilities located at or adjacent to the site proposed for the development of the Mesa-Falcon Field Airport. At this time, all of the land identified for acquisition is held by the City or is privately owned. No agency responses were received that referenced Section 4(f) resources or potential impacts.

HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

The Arizona State Historic Preservation Officer (SHPO) was contacted regarding the potential presence of cultural resources within the area of the proposed development. Their written response states that, "*.. we recommend that the proposed improvements and acquisition areas (in currently undeveloped areas) be surveyed by a qualified archaeologist to locate and evaluate any existing cultural remains. Once the survey is completed, a copy of the report should be sent to the SHPO office for review and comment*". A copy of this correspondence is included in **Appendix B.**

Should archaeologic resources be encountered during preconstruction or construction activities, work should cease in the area of the discovery and the SHPO be notified immediately, pursuant to 36 CFR 800.11. A statement to this effect should be included in any contractual agreement for airport construction.

BIOTIC COMMUNITIES

The existing topography is heavily impacted by development. Vacant lands are characteristic of the Lower Sonoran Desert, with Desert Saltbrush and Creosote Bush type vegetation. Due to the large amount of activity at the airport, only a small number of desert mammals and wildlife are present.
As part of this environmental evaluation, the U.S. Department of the Interior, Fish and Wildlife Service (USFWS) and the Arizona Game and Fish Department (AG&F) were contacted to request information regarding potential impacts to wildlife, plants and native habitat as a result of the proposed project. Both agencies were asked whether there were any threatened or endangered species or other species of special significance known to exist in the area of the project. The U.S. Fish and Wildlife Service indicated that there were no threatened and endangered species in the development area, although bald eagles are known to nest approximately six miles north of the airport. Correspondence from this agency is included in **Appendix B.**

COASTAL MANAGEMENT PROGRAM AND COASTAL BARRIERS

The Mesa-Falcon Field Airport is not located within the jurisdiction of any State Coastal

Management Program. The Coastal Zone Barrier resources system consists of undeveloped coastal barriers along the Atlantic and Gulf Coasts. These resources are well outside the sphere of influence of Mesa and its vicinity, and do not apply to the proposed action.

WILD AND SCENIC RIVERS

According to the River Mileage Classifications for Components of the National Wild and Scenic Rivers System, there are no rivers within the region that are protected by the Wild and Scenic Rivers Act (PL-90-542) as amended.

WETLANDS

No correspondence was received to indicate that wetlands would be impacted by the development of Mesa-Falcon Field Airport.

FLOODPLAIN

Federal Emergency Management Act (FEMA) maps were examined to identify designated 100 year floodplain areas within the proposed project or immediate vicinity. No portion of this project lies within a 100 year floodplain.

FARMLAND

No cultivated farmland exists on the airport property except the property west of Greenfield Road. This property and a 34 acre parcel planned for acquisition immediately west of the airport property, are in agricultural use (citrus groves). The property was acquired for airport approach protection and it is planned to retain these properties in agricultural use. No airport development is planned within these areas during the planning period.

A letter from the United States Department of Agriculture, Soil Conservation Service did not indicate any unique impacts from proposed construction. Since prime and unique farmland in the State of Arizona includes, by definition, only land that is currently being irrigated, no land of this designation would be impacted by the proposed action.

ENERGY SUPPLY AND NATURAL RESOURCES

There are no known energy production or supply facilities that would be affected by the proposed project and no impacts are anticipated on the development of energy resources.

A slight increase in energy demand will likely occur as a result of the proposed projects. Additional electricity will be needed for taxiway/taxilane and parking area lighting, the medium intensity runway lighting, and additional buildings/hangars. This increase in electrical demand is not expected to be significant.

In addition to this electric demand, expenditures of manpower, fuel, electricity, chemicals, water and other forms of energy will be necessary to construct the improvements and to provide for maintenance and operation of the facilities.
Traffic to the airport is likely to increase, however, the existing transportation network is more than adequate to meet the airport needs. Increases in automobile traffic are not expected to be significant.

LIGHT EMISSIONS

The proposed lighting improvements for the short and midterm development include Medium Intensity Runway Lighting, REIL's for Runway 4L-22R and Medium Intensity Taxiway Lighting. It is also anticipated that light poles would eventually be installed

within the automobile parking and terminal apron areas to provide security.
Due to the limited nature of the light generating equipment proposed and the distance from light-sensitive land uses, the proposed improvements are not expected to result in a significant increase in light emission impacts. If problems do materialize, they can be handled on a case-by-case basis by shielding or adjusting the angle of the lighting.

To reduce potential impacts associated with project lighting, the use of low pressure sodium lights is recommended for all public automobile parking areas and driveways.

SOLID WASTE

The increase in the generation of solid waste anticipated as a result of the proposed action will be slight. The City of Mesa will be responsible for collection and proper disposal.

CONSTRUCTION IMPACTS

Construction activities have the potential to create temporary environmental impacts. These impacts will primarily relate to noise resulting from heavy construction equipment, fugitive dust emissions resulting from construction activities, and potential impacts on water quality from runoff and soil erosion from exposed surfaces.

A temporary increase in particulate emissions and fugitive dust may result from construction activities. The use of temporary dirt access roads would increase the generation of particulates. Dust control measures, such as the watering of exposed soil areas (see section on Air Quality), will be implemented to minimize this localized impact. Any necessary clearing and grubbing of construction areas will be conducted in sections or sequenced whenever possible to minimize the amount of exposed soil at any one time. All vehicular traffic will be restricted to the construction site and established roadways.
Temporary dikes, basins and ditches will be utilized with each phase of construction to control erosion and sedimentation, and prevent degradation of off-airport surface water quality. After construction is complete, slopes and denuded areas will be reseeded to aid in the vegetation process. Provisions of Advisory Circular 150/5370/10A **Standards for Specifying Construction of Airport, Temporary Air and Water Pollution, Soil Erosion, and** Siltation Control will be incorporated into all project specifications.

Effects of construction are generally short term and localized. With the implementation of mitigation measures, impacts related to construction of the proposed project are not expected to be significant.

PUBLIC AND AGENCY INPUT

An analysis was made of the proposed project's consistency with objectives of federal, regional, state and local land use plans, policies and controls for the area concerned. To this end, various environmental and planning agencies were contacted in writing and by telephone to solicit general and site specific comments regarding the proposed development at Mesa-Falcon Field Airport. All written responses received from these agencies, as well as interested citizens, are included in **Appendix B.**

Since the project is currently within the jurisdiction of the City of Mesa, the City was represented on the Planning Advisory Committee (PAC) established for the Airport Master Plan Update. No specific concerns were expressed regarding the proposed development.

In addition to agency coordination activities, the public was given the opportunity to provide input throughout the process. All meetings held with the PAC, as well as a presentation to the City Transportation

Board, were open to the public. Two meetings were advertized as public workshops and held at different locations in the airport environs. These public meetings were scheduled at the conclusion of important phases during the master plan process. In addition, a meeting was held with the Apache Wells Homeowners Association.

The development of the proposed Mesa-Falcon Field Airport is consistent with the objectives of both the Federal Aviation Administration's National Plan of Integrated Airport Systems, and the Arizona State Aviation System Plan.

CONCLUSION

Based on the review of potential environmental impacts and considerations anticipated as a result of the construction and development of Mesa-Falcon Field Airport, the major issues identified are summarized below. Mitigation measures may be recommended to limit the potential impacts related to a number of these resources. Please note that as more specific information is gathered through upcoming Environmental Assessment processes, additional issues may arise.

- Air Quality - limiting of fugitive dust during construction, and stabilization techniques for non-paved access roads to site.

- Water Quality - erosion control and storage and handling of fuel and other petroleum products.

- Floodplain/Storm Water Control - protect airport facilities from storm runoff damage and protection of downstream areas from increases in storm water runoff or degradation of water quality.

- Cultural Resources - survey required.